Origins of water scarcity in rural development in the Costa Rican dry tropics: Neoliberalism, international trade, and climate change

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This article examines the interactions between international politics, regional climate change, and local water scarcity in Costa Rica, looking particularly at the implications for agriculture and rural development.

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While droughts may result from changes in regional precipitation, water scarcity can be driven by a combination of social, economic, and environmental factors.\textsuperscript{1} Though research on interdisciplinary approaches to water scarcity-related assessments have increased,\textsuperscript{2,3,4} there remains limited understanding of the origins of water scarcity and the pathways through which it impacts vulnerable groups in specific regions.\textsuperscript{5} This knowledge is critical for implementing policies, programs, and interventions that go beyond supply- or demand-side water management to address systemic causes of water scarcity.\textsuperscript{6}

In this article, we examine interactions among international politics, regional climate shifts, and local water scarcity in rural development in Costa Rica. We identify how water scarcity has developed in the region and has negatively impacted some groups of farmers, while positively increasing profit for others.

The case demonstrates that water scarcity must be understood and practically managed within the context of (1) economic institutions, (2) the actions available to groups to respond to changing economic institutions and water availability (e.g., people's abilities to adapt within economic institutions), and (3) the impacts of those adaptations on others. Development programs and water management schemes that do not account for these systemic factors will face risks that can derail rural development initiatives meant to increase

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livelihood security, justice, and equal economic opportunity.

Neoliberalism: The economic restructuring of rural development in Costa Rica

Between 1980 and 1982, Costa Rica experienced its worst economic crisis since the country’s 1948 civil war. In this two-year time span, the Costa Rican economy compressed by 9.4% and annual inflation reached 90%; the proportion of the population living below the poverty line increased from 35% to 54%. Following this economic crisis, the Costa Rican economy underwent significant neoliberal structural reforms, including new policies that privatized and deregulated agricultural production, designed to bolster the role of the private sector in the national agricultural economy.

The International Monetary Fund (IMF), World Bank, USAID, and the Inter-American Development Bank (IADB), in return for their financial support, mandated these reforms, which specifically included the privatization of most state-owned agricultural mills and processing facilities and the reduction or abolition of tariffs on most agricultural goods, with the exception of rice.

Today, while domestic economic policy is no longer subject to the mandates of multilateral lending institutions, past reforms have restructured the economic institutions that define how Costa Rican smallholder farmers contribute to the country’s rice economy. These changes (i.e., smallholder farmers depend on privatized rice production facilities to purchase their harvests) have significantly changed, and in some cases increased, the risks that rural development projects and smallholder farmers face as the local climate becomes drier and more erratic.

The 28,000 ha Arenal-Tempisque Irrigation Project (Projecto de Riego del Arenal-Tempisque, PRAT) in Guanacaste, Costa Rica is the largest irrigation district in Central America (Figure 1). It is an agrarian development project that was initiated with the creation of the Agrarian Development Institute (Instituto de Desarrollo Agrario) and the National Subterranean Waters, Irrigation, and Drainage Service (Servicio Nacional de Aguas Subterráneas, Riego y Avenamiento) in the early 1980s. These new agencies were given authority to dictate water-use objectives for rural development.

The purpose of the PRAT was to provide smallholder farmers with land and irrigation water to increase agricultural productivity in semi-arid Guanacaste and fight rural poverty. Market access was to be provided to smallholder farmers directly by the government. However, the economic reforms of the 1980s fundamentally changed the ability of the PRAT to effectively support smallholder farmers’ abilities to cope with water scarcity.

Impacts of economic restructuring on irrigation districts

Economic restructuring, backed by the IMF, World Bank, and USAID, impacted the PRAT in three main ways:
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1. The liquidation of government-owned agricultural processing mills made smallholder farmers dependent on private rice mills for market access.

2. The newly-created private agricultural extension services that replaced state agricultural agencies were not viable for the smallholder farm sector throughout the 1980s and 1990s due to the high costs of these services. As a result, rather than strategically diversifying or implementing technological advances to adapt and remain competitive, smallholder farmers continued producing rice.

3. Economic restructuring abolished parcel size ownership restrictions in the PRAT for all types of farmers.

Throughout the late 1980s and into the early 2000s, smallholder rice production remained relatively stable. However, in 2006, Guanacaste Provence began experiencing drought conditions that have since persisted. At about the same time, the Costa Rican government started to debate the potential ratification of the Central American Free Trade Agreement (CAFTA), which was eventually signed by Costa Rica in 2009. These two global changes began to expose the ramifications of Costa Rica’s economic restructuring on rural development by forcing smallholder farmers to compete with larger commercial rice farms to remain in rice production in the context of worsening drought.

Drought and rice market access

The government debate over CAFTA launched an agricultural lobby in Costa Rica that resulted in price protections for rice producers. These price protections benefited farms based on the size of their rice yields: farmers who grew more rice reaped more benefits from the price protections. Large farms and mills in the PRAT began producing more rice based on this incentive – allowed because land size ownership restrictions did not exist after the restructuring. This excluded smallholder farmers from profitable agricultural supply chains because smallholder farmers relied solely on rice and had no alternative market access post-restructuring. Decreased mill demands for smallholder rice yields drove competition among smallholders to sell rice.

Drought in the Tempisque River Basin has increased since 2006, but it is not driving water scarcity (i.e. the lack of sufficient available water to meet water demands) in the PRAT. Water managers have adapted to drought by providing smallholder farmers with the water needed to successfully grow two rice crops per year. Water shortages primarily occur in the PRAT during the initial part of the dry season in the high water demand months of December and January. During these months, both rice and sugarcane are planted. Rice and sugarcane require large amounts of water during planting, and both crops must be planted near the start of the dry season so they can be harvested prior to the beginning of the next rainy season in May.

PRAT water managers designed and implemented a water-cycling program to spread...

Figure 2. An irrigated rice field in the PRAT. Source Benjamin Warner
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farmer-planting dates across multiple weeks, thereby allowing all farms to successfully plant and harvest prior to the beginning of the next rainy season. While the water-cycling program could allow all smallholder farmers to plant their rice crops and harvest before the rains begin, farmers who are forced to wait to plant have more difficulty selling their harvests to rice mills.

Rice mills stop buying smallholder rice toward the end of the season once mill storage is at capacity. Smallholder farmers who are forced to wait to plant must harvest and sell later in the season and risk the inability to sell their harvest. While it is possible for smallholder farmers to store their harvests, the high upfront cost and debts accrued throughout planting and harvesting necessitate the timely sale of their harvests.

Delayed water allocations, in combination with limited and uncertain access to the rice market, have led to conflicts, such as water piracy, among farmers throughout the PRAT. Farmers upstream in the irrigation system illegally modify irrigation infrastructure to gain early access to water, depriving downstream farmers of their water allocations. Many farmers furthest downstream plant rice but then lose their water access as a result of the water diverting actions – “piracy” – of upstream farmers. As a result, many downstream farmers lose their rice crops after planting.

Conclusion

Water scarcity and subsequent conflicts among smallholder farmers have resulted from the expansion of large commercial rice farms and production facilities. This expansion was driven by trade liberalization, but it was Costa Rica’s initial economic restructuring that provided these large farms with the ability to expand in the PRAT and ultimately redirect global climate change risks onto smallholder farmers.

Large farms profit while smallholder farmers in Guanacaste abandon their livelihoods and identities; this process continues even as water managers have successfully adapted water supply and allocation schemes to the risk of drought. Thus, we have provided further evidence that drought does not equate to scarcity outside the context of economic institutions. However, globalization and free trade are often assumed to be primary drivers of economic change that result in resource scarcity.

We have also shown that while they play a role, globalization and free trade may more accurately be viewed as catalysts that expose underlying and socio-economic structures that are ultimately at the root of water scarcity.

References

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